XMM-Newton
Overall Mission Status

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XUG Meeting #19
17–18 May 2018, ESAC
Please allow me to introduce myself... Projects

- PhD Astrophysics
- ISDC: Instrument specialist
- ISDC: Science Analysis software team lead
- ISOC: Operations Scientist
- ISOC: Science Operations Manager
- INTEGRAL Mission Manager
- ASTRO-H SOC Dev. Manager
- ASTRO-H ESA Mission Manager
- XMM-Newton Mission Manager
Please allow me to introduce myself ... Science
SPC unanimously approved an indicative extension to the operations of XMM-Newton (and other missions) in November 2017. Also approved indicative extension of Gaia in November 2017 and for INTEGRAL in February 2018. *Gaia & INTEGRAL relevant for overall budget, due to SPACON merger.*

Next Mission Extended Operations Review (MEOR) coming up on June 5th. No specific issues expected: hardware in good shape and productivity high.

*Now close to 5600 papers in refereed literature: 1 paper / 29 h since launch.*

see also presentation by N. Schartel

Mission Extension process then expected to be as on previous occasions, with 7 page extension case including 5 pages of science case for fall meeting of SPC.
The mission remains in very good shape

- EPIC cameras in same shape as for UG #18. No major incidents.
- Unfortunately, small damage (0.3% of surface) to Optical Monitor by accident.
  ➔ see presentation by A. Talavera
- The first phase of the fuel migration was successfully completed, in June 2017. This should ensure operations deep into the 2020s.
- Common Gaia/XMM-Newton/INTEGRAL SPACON team has been implemented and is formally in operations since 11 April 2018 after **lengthy and intensive** preparation.
  ➔ see presentations by M. Kirsch and M. Ehle
Fuel through the 2020’s

Current

Used fuel

Uncertainty (±18 kg)

Predicted fuel

2010 2015 2020 2025 2030

May 2027

July 2033

FD (Bookkeeping)
Main Tank 1 (derived)
Aux Tanks (derived Sum)
FD (projected)
Moving forward on payload calibration

UG recommendations have been addressed, as possible, and there is progress on various areas. Other areas, especially also for cross-calibration remain

c> see presentations by M. Smith, R. Gonzalez and A. Talavera

EPIC eff. area correction

New OM bad pixel map

OM time dep. sensitivity corr. updated

XRT PSF modification

PN gain correction

PN Timing & Burst Mode

NuSTAR cross-calibration

RGS eff. area change

NuSTAR cross-calibration
A strongly evolving SOC

- In 2018 and early 2019 several key people will retire: Ramón Muñoz, Antonio Talavera & Carlos Gabriel. Matthias Ehle is leaving XMM-team.

- New team members: Eva Verdugo, Ivan Valtchanov – half time in 2018, 80% and 100% in 2019ff. Focus on instrument support & calibration. More additions expected later, 2019 the latest.

- Loss of expertise, need to reorganise work within team.

- Use momentum of unavoidable change to revisit SOC and Ground Segment, considering changes and updates to technology, software, interfaces, procedures, structures, ... preparing for the 2020s, while delivering uninterrupted support.
Implementing the roadmap for long-term operations

- Post-operations Roadmap developed in 2016 & 2017. Many elements not only relevant for post-operational phase, but also for mid- to long-term evolution of software, pipeline and archive.
- Pipeline is being updated to, e.g., give pile-up information and spectra/lightcurves for bright sources. Preparing for bulk re-processing of all data.
- Science Analysis Software (SAS) is being made future proof: e.g., by use of Python, documentation improvements, VM/Docker technology, ...
- Remote Interface for Science Analysis (RISA), allows analysis through XSA Archive. Currently ~2 jobs per day.
In summary

- Stable community interest and productivity
- Spacecraft & instruments remain in good shape
- Less fuel use & tank replenishment ensure many more years
- Progress in (cross-)calibration, but several open issues
- Good progress on tasks from roadmap, effort continues
- SPACON merge ➟ impact on science ➟ mitigation effort
- Major changes in SOC, e.g., due to retirements

Impact on science ➟ mitigation effort

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